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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,896	08/20/2001	Michael Leon Kazar	SPIN-3	8068

7590 11/17/2005

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EXAMINER

THOMAS, SHANE M

ART UNIT PAPER NUMBER

2186

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/932,896	KAZAR, MICHAEL LEON	
	Examiner	Art Unit	
	Shane M. Thomas	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17-25 is/are allowed.
- 6) ☒ Claim(s) 1,3,4 and 7-9 is/are rejected.
- 7) ☒ Claim(s) 5,6 and 10-16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>8/31/2005</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office action is responsive to the response filed 9/19/2005. Claims 1 and 3-25 are pending. Applicants' arguments have been carefully and respectfully considered, but they are not persuasive. Accordingly, this action has been made FINAL.

All previously outstanding objections and rejections to the Applicant's disclosure and claims not contained in this Action have been respectfully withdrawn by the Examiner hereto.

Response to Arguments

Applicant's arguments filed 9/19/2005 have been fully considered but they are not persuasive.

Applicant argues on page 14 of the response that the prior art reference of Palmer does not teach the limitation "a disk arbitration mechanism that uses a time stamp-based voting algorithm over the disk blocks associated with the server to [ex]change votes for a primary server" but rather teaches a "time-based system in regard to an interval is open or not with respect to a membership." The Examiner respectfully disagrees.

Applicant's original disclosure does not state specifically what the timestamp data that is written comprises and therefore, the Examiner has given a broadest, reasonable interpretation of the claim limitation. Palmer teaches using a time-stamp voting algorithm by the writing of each active node wishing to be a member to the passive node in the current round to write current state of its invocation counter to its respective portion of the disk. These counters are updated each round as discussed in column 11, lines 47-58. These counters can be seen as being a "timestamp" since it records during which round each active node wishes to be part of a

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membership protocol for the passive node. The passive node will disregard any active nodes attempting to subscribe with an out-of-date invocation counter (column 13, line 51 - column 14, line 5. Therefore, it can be seen that because of the timestamp that is recorded by the invocation counter, the passive node can regulate which active nodes may be a part of the current membership protocol.

Applicant argues on page 15 that “it would not have been obvious to use a plurality of storage disks in such a circumstance and still be able to reliably maintain accurate data over time ...” The Examiner respectfully disagrees. Palmer specifically states in column 3, lines 6-11, that it would have been obvious to one having ordinary skill in the art how to extend the teachings of Palmer’s one shared resource system and extend it to apply to a multiple shared resource system. Thus the Applicant’s arguments have be traversed.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning (page 20 of the response), it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Further, the systems of Frank and Palmer are indeed similar in configuration as seen in the abstract of Frank (specifically a cluster organization of multiple nodes that share a common resource). Additionally, Frank teaches a fault-resistant method for network connectivity between nodes is lost and shared data may be corrupted. Frank teaches a method to overcome this

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situation (column 9, line 60 - column 10, line 3), which would have been beneficial to the system of Palmer when network connectivity between of the nodes is lost, thereby preventing a possible loss of shared data.

Examiner's rejections under 35 U.S.C. 103(a) have thus been maintained as follows.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,3,4, and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palmer et al. (U.S. Patent No. 6,748,438).

As per claim 1, Palmer shows a plurality of servers (602,603,604, and 605) in figure 6 and a disk 608 that has a reserved disk block 612A-D for each of the servers (column 12, lines 6-8). Each server is in communication with the disk as shown by connections 614-617. The shared storage disk 608 utilizes a disk arbitration mechanism (figure 10) that uses a timestamp based voting algorithm via the invocation counters of the servers (602B, 611) and the disk blocks 612A-D. In order for the shared storage to elect a primary server, the server must be part of the shared storage's membership view by subscribing to the shared storage (via the protocol of figure 7). Thus the serves indirectly --vote-- for control of the shared storage 608 by being part of the member view of the shared storage. The shared storage 608 chooses a primary server

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(referred to as the leader) in step 1006 of figure 10. Once elected, the leader server controls all accesses to the shared storage 608 (column 19, line 61 - column 20, line 4). The set of disk blocks 612A-D are used as a communication mechanism between the servers and the shared storage 608 during the membership subscription process of figure 7.

Palmer discloses the claimed invention except for where the number of shared storage disks is more than one. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized multiple shared storage disks 608, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. Refer to MPEP 2144.04 (vi)(b). With a duplication of shared storage of modified Palmer, the duplicate shared storage would have operated identically to that of the shared storage device 608 - receiving membership subscriptions (figure 7) and choosing a primary (leader) server to arbitrate access of the servers. In this case, the Examiner is regarding one shared storage disk to be a "set of disks" of --the D disks-- since one is a subset of a plurality. Thus it would have been seen that merely duplicating the number of shared storage disks 608 of Palmer would have produced no new or unexpected result.

As per claim 3, Palmer shows in figure 6 that each server has an index. (N1-N4). For example, server 602 has an index of '1.' See also column 18, lines 9-29.

As per claim 4, Palmer teaches in column 18, lines 40-63, that the disk arbitration mechanism (membership protocol) may at predetermined times (i.e. when the appropriate function is called) allow a server to read all of the disk blocks 612A-612D. The disk arbitration mechanism also requires that the servers write their own disk block 612A-612D to determine who will be a member for the shared storage 608 and ultimately, for who will be the leader

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(primary) server. The writing of the subscription to the disk block and the read of the other servers who have subscribed (i.e. the data blocks) occurs in step 707 of figure 7. Refer to column 13, lines 13-18.

As per claim 7, the rejection follows the rejection of claims 1 and 4. Each server reads the disk blocks in step 707 to determine which servers are subscribed to the shared storage device 608. The timestamp-based voting algorithm for choosing a primary server and the primary server arbitrating access of the disks was discussed in the rejection of claim 1 above. Further, the discussion regarding the disk blocks being used as a communication medium is also found in the rejection for claim 1.

As per claim 8, step 1002 of figure 10 shows the invocation of a membership protocol (figure 7). The Examiner is considering the step of --voting protocol-- to be figure 10 and as such, during the membership protocol of step 1002, the step 707 of figure 7 occurs when active nodes (servers) are joining the membership for access to the shared storage 608. Thus the reading step 707 occurs during the voting protocol.

As per claim 9, a winning server is chosen in step 1006. Once chosen, the winning server has access to, and use and control of the disk that the given time as well as may access the disk exclusively. Refer to column 19, lines 61-67.

Claims 1,3,4, and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palmer et al. (U.S. Patent No. 6,748,438) in view of Frank et al. (U.S. Patent No. 6,871,222)

As per claim 1, Palmer shows a plurality of servers (602,603,604, and 605) in figure 6 and a disk 608 that has a reserved disk block 612A-D for each of the servers (column 12, lines 6-8). Each server is in communication with the disk as shown by connections 614-617. The shared storage disk 608 utilizes a disk arbitration mechanism (figure 10) that uses a timestamp based voting algorithm via the invocation counters of the servers (602B, 611) and the disk blocks 612A-D. In order for the shared storage to elect a primary server, the server must be part of the shared storage's membership view by subscribing to the shared storage (via the protocol of figure 7). Thus the servers indirectly --vote-- for control of the shared storage 608 by being part of the member view of the shared storage. The shared storage 608 chooses a primary server (referred to as the leader) in step 1006 of figure 10. Once elected, the leader server controls all accesses to the shared storage 608 (column 19, line 61 - column 20, line 4). The set of disk blocks 612A-D are used as a communication mechanism between the servers and the shared storage 608 during the membership subscription process of figure 7.

Palmer does not explicitly teach shared storage 608 comprising multiple disks (D disks where D is greater than one). Frank shows a server cluster system that comprises shared storage (figure 1), and teaches in column 3, lines 44-54, that the shared storage may comprise multiple storage devices with each device comprising header 25 information including data indicating the identity of all devices accessing the shareable storage 22. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the voting protocol and shared storage management system of Palmer with the teaching of utilizing

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multiple shared storage devices of Frank in order to have been able to increase the amount of shared storage in the system of Palmer. Thus the system of modified Palmer would have been able to shared more data amongst servers 602-605. The Examiner is considering the header information of the multiple shared storage devices of Frank to be the membership area information - 612, 612A-612E, 611, and 650 - of the shared storage 608 of Palmer.

As per claim 3, Palmer shows in figure 6 that each server has an index. (N1-N4). For example, server 602 has and index of '1.' See also column 18, lines 9-29.

As per claim 4, Palmer teaches in column 18, lines 40-63, that the disk arbitration mechanism (membership protocol) may at predetermined times (i.e. when the appropriate function is called) allow a server to read all of the disk blocks 612A-612D. The disk arbitration mechanism also requires that the servers write their own disk block 612A-612D to determine who will be a member for the shared storage 608 and ultimately, for who will be the leader (primary) server. The writing of the subscription to the disk block and the read of the other servers who have subscribed (i.e. the data blocks) occurs in step 707 of figure 7. Refer to column 13, lines 13-18.

As per claim 7, the rejection follows the rejection of claims 1 and 4. Each server reads the disk blocks in step 707 to determine which servers are subscribed to the shared storage device 608. The timestamp-based voting algorithm for choosing a primary server and the primary server arbitrating access of the disks was discussed in the rejection of claim 1 above. Further, the discussion regarding the disk blocks being used as a communication medium is also found in the rejection for claim 1.

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As per claim 8, step 1002 of figure 10 shows the invocation of a membership protocol (figure 7). The Examiner is considering the step of --voting protocol-- to be figure 10 and as such, during the membership protocol of step 1002, the step 707 of figure 7 occurs when active nodes (servers) are joining the membership for access to the shared storage 608. Thus the reading step 707 occurs during the voting protocol.

As per claim 9, a winning server is chosen in step 1006. Once chosen, the winning server has access to, and use and control of the disk that the given time as well as may access the disk exclusively. Refer to column 19, lines 61-67.

Allowable Subject Matter

Claims 5 and 6 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 10-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 17-25 are allowable over the prior art of record as previously indicated.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shane M. Thomas whose telephone number is (571) 272-4188. The examiner can normally be reached on M-F 8:30 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt M. Kim can be reached on (571) 272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shane M. Thomas



HONG CHONG KIM
PRIMARY EXAMINER